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USSR Report

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No. 890



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ELECTRIC POWER AND POWER EQUIPMENT

KIRGIZ HYDROELECTRIC POWER STATIONS

Frunze SOVETSKAYA KIRGIZIYA in Russian 23 Jun 79 p 2

[Article B. Amanov, chief specialist on power engineering of Gosplan of the Kirgiz SSR: "Step by Step, Without Gaps"]

[Text] Electrical power production in the 10th Five-Year Plan will more than double in the republic and will reach nine billion kilowatt hours. But this is not the limit. The extent of the mastery of hydroelectric power engineering resources which can technically be used is not high. By 1980, it will amount to a little more than six percent. There are possibilities for a growth in development. And considerable ones at that.

Take, for example, the Naryn River. The scheme for the power engineering utilization of the Naryn, developed by the Central Asian department of the "Gidroyekt" Institute proposes the creation of several hydroelectric power stations on the river with an installed capacity of more than 5.6 million kilowatts. Right now, of the Nizhne-Naryn series, which is being erected first, the Toktogul'skaya GES and the first Uch-Kurganskaya are already operating, and the Kurpsayskaya is being built. At the next GES of the series, the Tash-Kumyrskaya, the technical and economic substantiating documentation is being drawn up, and provisions have been made to start the initial planning work on each Uch-Kurganskaya GES. These stations will complete the Nizhne-Naryn series and will run on the discharge of the Naryn River which is reregulated by the Kurpsayskaya GES.

Moreover, in the year just past, the technical and economic substantiating documentation has been worked up for the high efficiency first and second Kambaratinskaya GES's, the dams of which will be erected using a directed explosion procedure. The production cost per kilowatt hour output of electrical power at these hydroelectric stations will amount to 0.18 kopecks in all. In contrast to the Toktogul'skaya GES, the water reservoir of which is used not only for power engineering purposes, but also for irrigation, both Kambaratinskaya GES's will operate strictly in accordance with the power engineering chart.

The construction of the Sary-Dzhazskaya GES with a capacity of 250,000 kilowatts is planned for the electrical power supply of new mining

industry enterprises in the eastern part of the republic. It will built below the mouth of the tributary of the Akshiyarak. As we see, an extremely extensive program of electrical power engineering development is planned.

In the course of constructing the "Toktogulka", a highly skilled collective of hydroelectric builders was assembled in the republic, and the modern, well-equipped city of Kara-Kul' and the municipal village of Shamaldy-Say grew up. A large production base was created. The capacity of the plant was brought up to one million cubic meters of concrete annually. A high speed, craneless comprehensively mechanized method of pouring concrete layer by layer, called the "Toktogul'skiy" method, was borne here on the banks of the Naryn. The "Naryngidroenergostroy" construction project administration did not win just one labor victory. It became a powerful, specialized construction organization, capable of annually handling construction and installation work in the amount of 40-50 million rubles. It is quite important to retain and effectively utilize the collective of workers and specialists, as well as the powerful production base. For this, it is essential to show concern for its front-line work operations well in advance.

The Kurpsayskaya GES will go completely on-line in 1981. Having this in mind, the preparatory construction work must begin as early as 1980 for the Kambaratinskaya GES's Nos. 1 and 2, as well as for the Tash-Kumyrskaya in order to place it in service in the 11th Five-Year Plan. And in 1983, at the same time as the preliminary work on the construction of the last hydroelectric station of the Nizhne-Naryn series, the Uch-Kurganskaya, the construction of the major units of the Kambaratinskaya GES's must be expanded, placing them on-line in the 12th Five-Year Plan.

Such stage by stage construction, without interruption, is also advantageous from an economic viewpoint. By 1990, we will be able to bring the electrical power output per hydroelectric station up to 16 billion kilowatt hours as opposed to the 3.8 being generated right now. This is equivalent to a savings of 4.7 million tons of petroleum fuel or 8.6 million tons of hard coal annually.

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ELECTRIC POWER AND POWER EQUIPMENT

NUCLEAR POWER STATIONS DISCUSSED

Riga SOVETSKAYA LATVIYA in Russian 27 Jun 79 p 4

[Article by Yuriy Sinyakov, APN observer: "The Horizons of Science and Engineering; 25 Years for the First AES"]

[Excerpt] About 200 AES's are in operation now on our planet and more than 300 are in the construction and planning stage. According to data of the International Agency on Nuclear Energy (MAGATE), the total installed AES capacity in 1978 amounted to more than 100,000 megawatts - this is approximately 10% of the capacity of all of the world's electrical power stations. It is projected that AES capacity will triple by 1985, and by 2000, will go up by 15 times as compared to 1978. In other words, more than one-fourth of all of the electrical power produced in the world will be generated at nuclear power stations.

The exceptional interest manifest everywhere in AES's is explained by the overall growth in energy demand in the modern world, as well as by the rise in prices for conventional forms of organic fuel.

A program of AES construction is being implemented in a planned fashion in our nation, in accordance with the demands of the national economy. An entire constellation of nuclear stations is already shining on the electrical map of the USSR. New capacities, approximately 13 of them at 15,000 megawatts, will go on-line by the end of the current five-year plan. A large program of AES construction in the European portion of the nation is planned for the future, where the shortage of organic types of fuel - coal, shale and peat - is being felt. New nuclear addresses in Armenia, Crimea and the Western Ukraine are being added to the well known ones: Novovoronezhskiy, Leningrad, the Kola Peninsula and Beloyarsk in the Urals.

One of the most distant "stars", the Bilibinskaya AES, is gaining strength. It has grown up in Chukotka, in a kray where the Far East and Far North converge. The station will assist the steadfast people of the north in mastering the enormous region of permafrost which is poor in power resources, but is rich in useful minerals - copper, tin and mercury.

From the permafrost zone, we move on to the south, to the shores of the Caspian. Here, fresh water is being made from sea water in giga-c samovars — water distilling plants on the Mang'shlak Peninsula in the vicinity of Shevchenko. The heat is maintained in them by the first fast neutron reactor in the world.

The fast neutron reactor which supplies the city of Shevchenko with fresh water and provides it with electrical power, has the surprising capability of supplying itself with nuclear fuel. This is how academician I.V. Kurchatov spoke of this: "there are conditions under which new nuclear fuel is produced in greater quantities than the amount burned in the chain process of the original nuclear fuel. This is expanded breeding. It is as if you burn coal in a furnace and along with the ash, you rake out even more coal."

In this case, the expanded breeder factor can run from 1.4 to 1.7 depending on the type of reactor. This means that such a breeder reactor in consuming one kilogram of plutonium, not only returns it, but also produces 0.4-0.7 kilograms of plutonium in addition. To accelerate the transition to AES construction based on fast reactors — this is the problem facing in the Permanent Commission of the CEMA on the Utilization of Nuclear Power for Peaceful Purposes. For this, a coordinating technical council is at work at the Institute of Power Engineering Physics. Experiments are underway here in the physics and hydrodynamics of fast neutron reactors with a high capacity on the order of 1,600 megawatts. In designing the extremely complicated monitor instruments, specialists from Hungary, the GDR, Poland and Czechoslovakia are taking part along with Soviet scientists. The volume of the experiments is constantly increasing, and for this reason, it is planned that the CEMA member nations will join forces to construct a unified complex of test facilities at the Scientific Research Institute for Nuclear Reactors named V.I. Lenin in Ul'yanovsk.

Total safety and total waste-free operation are what the scientists of socialist nations are striving for. Is this goal attainable? The President of the USSR Academy of Sciences, Academician Anatoliy Petrovich Aleksandrov believes that in the future we will be able to utilize all of the side products of AES's. In his opinion, the amount of additional products which an AES will yield will be comparable in cost with the generated energy.

This is a miracle enterprise, is it not? It generates power, produces its own fuel and the wastes have industrial value. The latter, to be sure, is as yet an enticing dream. Tomorrow the dream can become just as much a reality as the nuclear power plants to which are tying our major power engineering prospects.

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ELECTRIC POWER AND POWER EQUIPMENT

DNESTR GES DISCUSSED

Moscow PRAVDA in Russian 3 Jul 79 p 1

[Article by M. Odinets, Chernovitskaya Oblast: "On the Banks of the Dnestr"]

[Text] We traveled up the Dnestr in a motor launch from Mogilev-Podol'skiy to Novodnistrovsk. High attractive banks, covered with a thick curly forest passed by. The river flowed peacefully, and at times it was necessary to skirt around long shoals. And it was not believable that this was the same Dnestr, the flood waters of which have led to sad consequences more than once. Over the past 100 years, less a few years, devastating floods have been observed here 14 times. During this year, the river has overflowed twice because of ice jams and fast snow thaws. Mogilev-Podol'skiy was flooded in the spring. In order to tame the violent temper of the temper of the river, and give its energy to enterprises and water to the fields and population of the Ukraine and Moldavia, the decision was made to design a hydroelectric unit in the center course of the Dnestr with an electrical power station having a design capacity of 702,000 kilowatts, and a water reservoir with an area of 142,000 square kilometers. Thus the settlement of Novodnistrovsk grew up close to the future hydroelectric unit.

The following is written in the Main Direction for the Development of the USSR National Economy During 1976-1980: "Place the first units on-line at the Dnestrovskaya GES, which is of considerable importance for electrical power engineering and land reclamation."

At the construction site, we met with the chief engineer of the construction project, S. Gandzyuk. He talked about how work is going on the construction of the hydroelectric unit. Gandzyuk built the Kakhovskaya GES and dug the Dnepr--Krivoy Rog canal.

"A lot has been done" said the chief engineer. "We have dammed the Dnestr. A large volume of rock and earthmoving work has been done, the removal of earth from the excavation pit for the electrical power station is being completed, and we are pouring the concrete in the GES building. A reorganization was carried out at the start of the year. Some four construction administrations were created instead of the multiplicity of small ones.

Each of them is engaged in the execution of a specific task. The concentration of forces has permitted accelerating the pace of construction. However, the lag which was allowed in the first years of the construction project speaks for itself. The plan for the construction of the starting complex called for the utilization by now of about 21 million rubles, and in the coming year, 36 million rubles. This exceeds our production capacities.

Yes, the construction program is now twice as that of last year. The preliminary totals for the first biennium show that it is not being carried out. There are numerous reasons for the lag. In particular, as was reported to us at the party committee, they are found in the deficient organizational work, the poor construction production layout, and weak technological discipline. Blast hole drilling work is holding up progress. This work is being carried out with delays and with poor attention to detail. The builders complain that because of this, the finish work on the rock foundation must be done two and three times. In this way, concrete pouring is being delayed at the major structural units.

One can see excavators, cranes and motor vehicles standing idle at the construction site. In the past year, the output per ton of load lifting capacity of the cranes amounted to 42.3% in all. But judging by everything else, no conclusions were drawn from this. Considerable down times of the equipment are permitted even now. The builders complain also about the work of the concrete and mortar plant, where labor discipline is low. There are considerable losses of work time at the construction project also because of the lack of materials and interruptions in the power supply.

In publishing the order concerning the assurance of placing the first units of the Dnestrovskaya GES on-line in 1980, the USSR Ministry of Power Engineering and Electrification did not concern itself with the normal support of the project with material and technical resources. Thus, the plan for the first biennium amounts to almost half of the plan for the current year, while overall, 34 percent of the rolled metal and 31 percent of the cement have been allocated. But even this quantity of materials is supplied from the Krivoy Rog, Dneprodzerzhinsk metallurgical and Kamenets-Podol'skiy cement plants with considerable interruptions. The Kurakhovskiy housing construction combine, the Dneprodzerzhinskiy and Kaluga plants supply reinforced concrete products to the construction project. Unfortunately, the deliveries of cranes, motor vehicles, bulldozers and excavators are being broken off.

Personnel turnover is high. Workers and specialists come and go. Suffice it to say that the fourth administration chief in recent years is working at the construction project. In the past year, the Minister of Power Engineering and Electrification of the USSR, P. Neporozhniy visited here. He promised to assist the collective, but this assistance has not as yet been felt.

And help is really needed. In order to place the first units on-line in the coming year, the GES builders must erect the building of the electrical power station, build the dam between the shores of the Dnestr, and prepare the

slopes of the water reservoir. There is really a lot to do, and without the support of the ministry and without the mobilization of all of the internal reserves, it is impossible to carry out the program.

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ENERGY CONSERVATION

FUEL AND ENERGY ECONOMY IN TADZHIKISTAN

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 26 Jun 79 p 1

[Editorial: "Strict Accounting of Fuel and Energy"]

[Excerpts] The liquid fuel producers are also manifesting a valuable initiative. They are persistently increasing fuel resources by efficient use of more productive equipment and technology. Diamond drilling not only accelerates sinking of wells, but also appreciably reduces its energy consumption. Since the beginning of the five-year plan, the oil workers of the republic have saved 1,000 tons of diesel fuel, 2.5 million kilowatt-hours of electric energy and 2.5 million gigacalories of heat.

A zealous and thrifty attitude toward material resources is typical for many kolkhozes and sovkhoses. Specific measures are implemented annually at the Regarskiy Kolkhoz imeni Lenin on economy in the use of petroleum products by improving the operation of agricultural equipment, reducing losses, improving oil-storage facilities and bringing order to keeping records of reception and consumption of fuel and lubricating materials. Progressive scientifically based norms of petroleum product consumption in field operations and truck transport have been introduced at the kolkhoz and incentives for real savings have been provided. Last year 7.3 kg of diesel fuel per standard hectare were expended on the farm. The norm of fuel consumption in transport operations was reduced by 11 percent.

The campaign of the savers is being expanded. There is also experience worthy of distribution in Kanibadamskiy, Kumsangirskiy and other rayons. But there are still very high reserves for economizing. A mass check of the utilization of fuel and energy resources, organized by the Republic Committee of Peoples Control, revealed serious gaps: accurate accounting for electricity and heat has not been practiced at a number of enterprises and farms: they are being expended inefficiently. There are many reasons for this -- incomplete loading of equipment, idle times of agricultural equipment, violations of the technology of work production and inefficient operation of transport facilities. Losses of electric energy and heat are high in the housing-communal sector.

The fact that the task on saving electric energy was not fulfilled by the ministries of the light, meat and milk industry, by industrial construction materials enterprises and by Tadzhikpotrebcoyuz [Tadzhik Union of Consumers' Societies] is alarming. There are also debtors in thermal energy. As it turns out, quite unresolved problems are the basis for overconsumption and losses. For example, the natural lighting of plant shops should be improved and underground communications lines should be put in order since it reduces the demand for electric lighting and stops leakage of steam or hot water. However, the managers and public organizations of the Dushanbe Asbestos-Cement Products Combine, Promstorymaterialy Trust, the Dushanbe Association of Brick Plants, the Kulyab and Khorog Meat-Packing combines for some reason did not devote the proper attention to these losses and did not implement effective measures on saving electric energy and heat.

Or take this problem. It is assumed that all the communal-service needs for fuel can be practically satisfied by Shurabskiy coal. And at the same time, approximately 6,000 tons of diesel fuel and more than 500 tons of gasoline were unjustifiably utilized last year for communal-service needs (heating and baths) in the rural areas of the republic. The guilty ones were made responsible. In the interests of the matter, a wider allocation should be given for communal-service and agricultural enterprises in the sphere of servicing Shurabskiy coal.

The situation with the use of petroleum productions requires implementation of vigorous measures which would stop carelessness and the use of fuel and lubricating materials for other than what they are intended from the managers of enterprises and farms, organizations and agencies. Last year the enterprises of Tadzhikgoscokmsel'khoztekhnika overconsumed 1,200 tons of light-weight petroleum products. Overburning of diesel fuel and gasoline in field and transport operations was unfortunately repeated during the first quarter of this year.

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ENERGY CONSERVATION

ENERGY CONSERVATION AND ENERGY SAVINGS AT ENTERPRISES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 5 Jul 79 p 4

[Article by Yu. Kopytov, chief engineer of the State Inspection for Industrial Power Engineering and for Power Engineering Supervision]

[Text] To begin, I would like to present some data from reports of the Gosenergonadzor [State Inspection for Industrial Power Engineering and for Power Engineering Supervision] during the past year: "A total of 13.8 billion kilowatt-hours of electric and 27.7 million gigacalories of thermal energy was saved at enterprises of the transport and construction industry. Approximately 650 enterprises permitted overconsumption of energy resources compared to the established norms." What are these figures talking about? I think that primarily they are talking about the large reserves which our national economy has at its disposal in the sense of more efficient use of thermal and energy resources.

The achieved saving should not make us complacent since the number of enterprises where a careless attitude toward consumption of electric and thermal energy is permitted is still large. The recently published decree of the CPSU Central Committee and the USSR Council of Ministers "On providing the national economy and populace with fuel, electric and thermal energy during the fall-winter season of 1979/1980" obligates everyone to universally establish the strictest control over efficient use of all fuel and energy resources. What is the best way to solve this most important state problem?

Our inspectors annually conduct tens of thousands of investigations of enterprises and organizations to determine the reserves for energy resource economy. And this is what analysis of these investigations shows.

Measures, even well-known measures checked by many years of practice, which contribute a significant saving of energy resources, are not being implemented at many enterprises. Let us say, there are those such as substitution of ring valves of piston compressors for direct-flow valves, replacement of incandescent light bulbs by fluorescent and mercury lamps, the use of circulating water supply, coating electric resistance furnaces with aluminum paint and so on.

Even those proposals of innovators which are of real interest at domestic enterprises are far from always being introduced. Only a brief abstract of the innovation is contained in the collections which we publish and only the idea itself is outlined. But specialists need technical documentation. We receive thousands of requests annually to send drawings and calculations. We readdress them to the place where the innovation was born. And in most cases the matter ends with this, since the authors are unable to be involved with compilation and reproduction of drawings in order to send them throughout the entire country.

Permanently operating committees on economizing of energy resources have been organized at practically every plant, factory and mine. Mass inspections and raids are conducted everywhere. However, all this work is activated only after the corresponding directive instructions and has little effect after completion of the routine campaign.

Only the use of modern, less energy-consuming equipment and progressive production processes can provide a significant reduction of the demand for energy resources. Here is one of the examples: 22 percent of the electric energy at enterprises of Minkhimprom [Ministry of the Chemical Industry] is consumed for ammonia production. The specific consumption comprises 1,490 kilowatt-hours for each ton of product by the traditional technology, whereas a new process flow diagram of ammonia production in which the specific consumption of electric energy is 15 (!) times less has been developed at some plants.

It is understandable that these types of large measures can be carried out only on a clearly planned basis -- campaigns will be of no help here. The necessary expenditures must be envisioned beforehand in plans and applications for equipment and materials must be formulated beforehand, and in some cases planning and design work must be carried out beforehand. This is how they operate at the Magnitogorsk Metallurgical Combine, at the Volgograd Production Association Barrikady, at the Novo-Gor'kiy Petroleum Refining Plant and a number of other leading enterprises.

Unfortunately, they do not proceed in this manner everywhere. One can say that on the whole work on efficient use of electric and thermal energy has a shortage of an organizing planning basis. Large measures directed toward reduction of energy consumption are usually not reflected in current and future plans of the branches of industry. The ministries and agencies very slowly and unwillingly introduce scientifically justified norms of energy consumption.

If we want to achieve discernible success in such an important matter as economic consumption of fuel and energy resources, then the approach to solution of this problem should also be a state approach, such as, for example, in introduction of new technology. Specific tasks on introduction of new technology, as is known, are now available to each enterprise and each industrial ministry and they are an integral part in the national

economic plan. Why not also establish this procedure when planning large measures which provide more efficient use of energy? And perhaps it also makes sense in developing a complex purposeful program on this problem?

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ENERGY CONSERVATION

CONSERVATION IN CONSUMPTION OF PETROLEUM PRODUCTS

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 28 Jun 79 p 2

[Article by V. Dremkov, chief of Kazgosnefteinspektsiya: "Conserve Petroleum Products"]

[Text] Control of losses and economy both large and small are one of the main reserves for the most rapid development of the national economy. It was noted at the November (1978) Plenary Session of the CPSU Central Committee that conditions of economy should be sequentially implemented in each sector, in each production collective and at each job site.

Measures on efficient use of petroleum products should also have an important effect in the struggle for a zealous attitude toward the national good. Work in this direction has improved considerably during the past few years in our republic. However, many reserves have still not been put into operation.

In August 1978, state inspection on control of the use of petroleum products (Kazgosnefteinspektsiya) was organized in the staff of the Main Administration for Supply of Petroleum Products. It recently checked a number of enterprises and organizations of different sectors of the national economy of the republic.

This is what was found. Additional tasks for 1979 on saving gasoline and diesel and boiler-furnace fuel have been brought by many ministries and agencies to their own enterprises with a long delay. It is no accident that there are no plans for organizational-technical measures in most production collectives and those that do exist are usually compiled without regard to the use of reserves and calculation of the anticipated saving, deadlines are not designated and executors have not been determined. Other facts have also been revealed. Correct normalization of consumption should play an important role in increasing the efficient use of petroleum products. The inspection ascertained that differentiated norms for 1979 have not been established at many enterprises. Thus, the existing temporary linear norms for use of liquid fuel for motor transport are rarely used without regard to correcting coefficients. Prizes for saving fuel and lubricating materials to the driver staff are usually not paid in the motor subdivisions and the parties guilty of overconsumption are not held materially responsible.

The example of PMK-41 [Mobile mechanized column] of the Alma-Ata oblvodkhoz [Oblast administration of water management] is typical. Technically justified norms of fuel consumption for excavation and construction equipment and correcting coefficients are not used here. It is impossible to establish from the report data how much fuel was used. The working time of truck drivers and consequently the volume of work completed by them are overexaggerated on the trip tickets. A control log of the odometers is not kept. A graph of "movement of fuel" is filled out only by the quantity of fuel issued, but no one is interested how it was utilized. Under these conditions we cannot talk about some normalization and organization of a real competition to observe conditions of economy.

Errors in normalization and the absence of proper accounting inevitably lead to significant overconsumption of fuel. In 1978, 85,200 liters of gasoline were "overburned" for these reasons at the automotive base of the Kokchetavvodstroy Trust. The situation is also not being corrected this year.

Accounting for the consumption of fuel and lubricating materials in this motor facility is not being tied in with the completed volume of freight shipments. Section superintendent V. Geytsenreyder artificially increased the operating time of machinery in writing of fuel at the PMK-31 of this trust. In May 1978 alone, an excess of 43,200 kilograms of diesel fuel and 2,300 kilograms of diesel oil were written off in this manner. The managers of the motor pool of the Kokchetavvodstroy Trust usually compensate for the permitted overburning of fuel by acquisition of it from other organizations. A total of 64,100 liters of gasoline and 81,000 kilograms of diesel fuel were purchased "on the side" by this base during 1978. This "operation" cost more than 15,000 rubles.

It must be noted that this practice is rather widespread. Many enterprises permit illegal purchase and sales of petroleum products in outside organizations or barter them for other materials. Therefore, one should again recall that funds for fuel and oil are allocated in strict adherence to the planned need, sales of them on the side are forbidden and is regarded as a flagrant violation of fund discipline.

One of the channels of oil losses is lack of monitoring for issue of coupons to the driver staff for petroleum products. Thus, the drivers at the Taldy-Kurgan Reinforced Concrete Products Plant of Remstroytekhnika [Expansion unknown] had unused gasoline coupons for a total amount of 10,968 liters in the 1978 audit. All this is related to losses of the enterprise.

A large reserve for supplementing the fuel and lubricating material resources is collection of used petroleum products. However, a check established that the procedure for collection of used oils by grades is not being observed at many enterprises, mixing them in the same tank is practiced and this eliminates the possibility of regeneration and secondary use.

Attention is not being devoted at most farms to proper storage of petroleum products. The tanks in which they are stored are not airtight, which leads to evaporation of them. There are frequent cases when equipment is refueled by primitive means. This practice leads to large losses and spoiling the quality of fuel-lubricating materials and has a negative effect on preventive maintenance of the machine-tractor fleet..

Analyzing the results of the check, one can conclude that the deficiencies in the use of petroleum products are the result of the fact that many managers of enterprises and agencies are not sufficiently concerned about efficient and rational consumption of valuable fuel and lubricating raw material and do not hold the wastrels of national property strictly responsible. And this is impermissible. Economy and thriftiness should become the law for everyone.

6521

CSO: 1822

ENERGY CONSERVATION

ECONOMY OF METAL, CEMENT, LUMBER, FUEL AND ELECTRIC ENERGY URGED

Tbilisi ZARYA VOSTOKA in Russian 10 Jul 79 p 1

[Article: "Intensify Organizing Work on Economy of Metal, Cement, Lumber, Fuel and Electric Energy"]

[Text] The Central Committee of the Georgian Communist Party adopted a decree on measures to intensify organizing work on economy of metal, cement, lumber, fuel and electric energy in light of the decisions of the 25th CPSU Congress.

It was noted in the decree that the collectives of industrial enterprises and construction and transport organizations of the republic are conducting specific work on economy of basic material resources -- metal, cement, lumber, fuel and electric energy.

However, as noted in the decree, this work does not fully meet the requirements of the 25th CPSU Congress. Its main deficiency is the absence of a clear system of managing the conditions of economy and thriftiness. The conducted measures are usually of a local and not mutually coordinated nature, and there is no complex scientific approach to the work on solving this problem. Party, Soviet and economic organizations are not sufficiently occupied locally with the subject of solving problems of economy and thriftiness and are poorly utilizing leading experience. The capabilities of scientific research and planning organizations in control of thriftiness and economy are not being fully taken into account.

Trade-union organizations are not adopting the necessary measures to develop a competition of the broad masses for economy of material resources. Elements of formalism are observed in this matter. Komsomol organizations are also being poorly recruited to this work.

To intensify organizing work on economy of metal, cement, lumber, fuel and electric energy in light of the decisions of the 25th CPSU Congress, the Central Committee of the Georgian Communist Party pledged:

that the obkoms, gorkoms and raykoms of the Georgian Communist Party and the primary party organizations will implement a complex of organizing-mass and political measures on economy of these materials by providing national-practical conferences, conferences-seminars and public inspections, dissemination and introduction of leading experience, creative campaigns, expanding the topic of materials on problems of economy and thriftiness in the political education and economic education system and activation of the activity of committees on control of the economic activity of the administration in the field of economy of material resources.

Personal responsibility for solving problems and of implementing measures on economy of metal, cement, lumber, fuel and electric energy is entrusted to the managers of ministries, agencies, industrial enterprises, construction and transport organizations, kolkhozes and sovkhoses and scientific research and planning institutes.

It has been decided to create a republic council on economy of metal, cement, lumber, fuel and electric energy. The secretary of the Central Committee of the Georgian Communist Party Z. A. Chkheidze has been confirmed as chairman of the council.

Coordination of the work of economic bodies, public opinion, organization and conducting public inspections, scientific-practical conferences and conferences-seminars, permanent exhibitions, control over fulfillment of the instructions and decrees of the directive bodies and recommendations of scientific-practical conferences on economy of raw material and resources has been entrusted to the republic council.

The ministries, agencies and managers of production associations, industrial enterprises of All-Union subordination, construction, transport and agricultural organizations have been entrusted with working out and confirming complex programs for 1980-1985 at each enterprise on economy of metal, cement, lumber, fuel and electric energy on the basis of creative contacts with scientific research institutions, design offices and related supply organizations and consumers.

The planning and scientific research institutes, design offices, institutes of metallurgy and construction affairs of the Georgian SSR Academy of Sciences, the Institute of Economics and Planning of the National Economy of Gosplan of the Georgian SSR, NTO [Scientific and Technical Department] and VOIR [All-Union Society of Inventors and Efficiency Experts] will plan and implement measures to intensify the cooperation of science and industry in the field of economy and efficient use of basic material resources -- metal, cement, lumber, fuel and electric energy on the basis of developing innovator and inventive work and introduction of leading experience.

The State Committee on Science and Technology, Gosstroy and the Georgian SSR Academy of Sciences have been instructed with working out complex plans for 1980-1985 on participation of scientific research, planning and design organizations in solving problems of economy of metal, cement, lumber, fuel and electric energy.

Gossnab of the Georgian SSR has pledged to intensify control over proper use, storage and adherence to fund discipline, norms of metal, cement, lumber and fuel consumption and to work out a complex of measures to prevent wastefulness and unthriftiness in consumption of the indicated materials.

The Main Production Administration of Power Engineering and Electrification of the Georgian SSR (Gruzglavenergo) has been given the task of working out during the third quarter of this year a system of permanently effective measures on economy of electric and thermal energy, bearing in mind the sharp reduction of energy losses in networks during transportation, bringing the established power and lighting capacities and the use of secondary fuel into accord with the technical operating rules.

The Central Committee of the Georgian Communist Party has obligated the Georgian Trade Union Council and republic and local trade-union committees to work out and implement a system of measures to increase the effectiveness of the socialist competition for saving material resources, conducting public inspections and disseminating the experience of production innovators and leading collectives in the struggle for economy and thriftiness.

The best examples of the activity of the collectives of enterprises, shops, sections and individual workers on thrifty use of basic materials should be extensively publicized in schools of communist labor and the efforts of the students should be directed toward finding additional reserves for economy of them.

The Central Committee of the Georgian Komsomol, obkoms, gorkoms and raykoms of the LKSM [Lenin Young Communist League] of Georgia and the primary komsomol organizations have been called upon to activate the work of "komsomol projectors" by directing their activity toward intensification of the struggle for economy and thriftiness. Extensive participation of youth in the conducted measures is provided.

The editorial offices of republic and city newspapers, the State Committee on Radio and Television of the republic and GruzINFORM [Georgian Information Office] have been entrusted with intensifying preparation of materials on problems of economy of metal, cement, lumber, fuel and electric energy, to extensively recruit leaders and innovators of production, engineers and technicians, economic managers, party, trade-union and komsomol workers and representatives of science with accounts of their work experience in solving this problem in the press, on radio and television.

The Central Committee of the Georgian Communist Party has expressed confidence that the efforts of party, Soviet and economic bodies and trade-union and komsomol organizations in realization of the system of developed measures on economy will ensure a final economic effect in the national economy of the republic.

ENERGY CONSERVATION

BRIEFS

GAS PIPELINE REPAIR--Gazli, Bukharskaya Oblast--A burst of flame lit up the sands and a thundering roar was heard above the desert. One of three of the Bukhara Urals gas pipelines had ruptured. Powerful temperature stresses had weakened the metal and the gas pressure blew out a 50-meter segment of pipe from the trench. The subdivisions of the line-operating service of the Gazlineftegazdobycha Association raised the alarm upon a signal. Experienced specialists and workers rushed to the scene of the accident with the necessary equipment. They welded and laid a new "lash" in the trench to replace the one that was damaged. They worked without hurrying, thinking over each step. At the same time, both sides of the damaged section were covered with gate valves to prevent loss of fuel. Both the remaining "threads" of the main line began to operate in a more intensive mode, compensating for the failure of one line. The emergency occurred at midnight. And when the morning sun began to rise, the operations had already been completed. Pipe-layer operator I. Yefremov, welder I. Mel'nikov, chief of the operating section A. Goryaev and engineer M. Miloserdov distinguished themselves in correcting the accident. A total of 10 hours was required to correct the accident. It was later calculated that 30 hours is allocated for this volume of work according to the norms. They did not know about the emergency in the Urals: after all, the delivery of gas to the main line was not interrupted. [Text] [Tashkent PRAVDA VOSTOKA in Russian 1 Jul 79 p 4] 6521

ELECTRIC POWER TRANSMISSION--The Kurskaya AES-Bryansk electric power transmission line with voltage of 750 kilovolts is being erected by a collective of the Tsentrostroyelektropredacha Trust. The builders are utilizing a new type of metal poles of lightweight design here, production of which has been organized at enterprises of the trust. They are almost one-fourth as light as the existing poles and do not require massive footings. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 10 Jul 79 p 1] 6521

ELECTRIC POWER TRANSMISSION LINES--Dushanbe, 15 Jul 79--Complex tests of the first electric power transmission lines without poles, constructed 10 kilometers from the capital of Tadzhikistan in Varzobskiy Canyon, have been completed. The 150-kilometer electric power transmission line is supported on

one-sided suspensions. Five of its spans intersecting the canyon 200 meters high are attached to footings in the rocks. The Varzobskiy experiment is solving two large-scale practical problems. It is known that two-thirds of the expenditures in construction of electric power transmission lines go to supports. An electric power transmission line on one-sided cable suspensions is much less expensive and simpler to execute. By using poleless electric power transmission lines, it is possible to deliver energy to Kishlaks beyond the clouds and to mines more economically. [Text] [Moscow PRAVDA in Russian 16 Jul 79 p 2] 6521

GAS PRODUCTION--More than 90 billion cubic meters of "blue fuel" have been shipped to consumers since the beginning of the year by the collective of the Tyumengazprom Association. In fulfilling the decree of the CPSU Central Committee and the USSR Council of Ministers "On providing the national economy and the populace with fuel, electric and thermal energy during the fall-winter season of 1979-1980," the Tyumen' workers have worked out specific measures, implementation of which contributes to successful work of the gas producers. The national economy has received almost 900 million cubic meters of gas above the plan from them. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 29 Jun 79 p 1] 6521

RIVER RECLAMATION--Ust'-Ilimsk (Irkutskaya Oblast), 24 Jun 79--Green flags have been raised above one of the Angara pools in the lower race of the Ust'-Ilimskaya GES. This is a signal that divers have begun final operations to construct a fan collector of waste waters of the cellulose plant, which have undergone complete cleaning. Not only water clear as crystal, but water enriched with oxygen will be returned to the Angara River. Four steel discharge "threads" have been laid on the bottom of the river in a special trench. It is planned to lay pipes from specially equipped barges. Specialists of the hydraulic mechanization section of Bratskgesstroy used a suction dredge. This made it possible to weld the pipelines on shore. [Text] [Moscow PRAVDA in Russian 25 Jun 79 p 2] 6521

POWER STATION CONSTRUCTION--The tempos of constructing Central Asia's largest Rogunskaya GES on the Vakhsh River are increasing. An underground hydroelectric power plant will be constructed in the deep mountain canyon and a stone-earthen dam 135 meters high will be raised. Six units having capacity of 1.6 million kilowatts and a future reservoir will contribute to further development of the industry and agriculture of Tadzhikistan. Preparatory work is now being carried out at sites of the GES. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Jun 79 p 2] 6521

NEW GAS FIELD--Gaz Achak, Turkmenanskaya SSR--The geologists and drillers of the Achak Administration of Drilling Operations of the Achakgazdobycha Association have discovered a new promising gas field. The gas seam was found at a depth of more than 1,000 meters. Investigations of the first well showed that its daily yield comprises 800,000 cubic meters. The field has been named Gagarin in honor of the world's first cosmonaut. Intensive drilling of producer wells is now under way at the new site. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 7 Jun 79 p 2] 6521

PIPELINE CONSTRUCTION--Months of intensive, heroic labor of several thousand builders preceded this event. And now at 0800 on 22 June, the 1,250 kilometer pipeline, which was laid from Surgut to Perm' by subdivisions of Minneftegazstroy, began to fill up with oil. This underground mainline is part of the gigantic artery along which Tyumen' oil will reach Polotsk this year. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 27 Jun 79 p 1] 6521

COMPRESSOR STATION CONSTRUCTION--The Tyumen' builders have installed the building of the largest compressor station -- Purpeyskaya -- on the Urengoy Chelyabinsk gas pipeline in only 1 month -- two or more times more rapidly than provided by normative deadlines. The builders pledged to create the Urengoy-Chelyabinsk gas-transport system this year with capacity of 110 million cubic meters of blue fuel daily. [Text] [Moscow MOSKOVSKAYA PRAVDA in Russian 12 Jul 79 p 1] 6521

GAS PIPELINE OPERATION--Leningrad, 30 Jul 79--Today "blue fuel" arrived at the city along the Gryazovets-Leningrad gas pipeline. The work of the builders who laid the 600-kilometer mainline from the "Siyanie Severa" pipeline within compressed deadlines, was completed. It makes it possible to improve the supply of enterprises and new microrayons of the city and to increase the delivery of fuel from the fields of western Siberia and the Komi ASSR to the central regions. More than 10 billion cubic meters of fuel will be delivered along the mainline annually. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 31 Jul 79 p 1] 6521

ELECTRIC POWER TRANSMISSION--The 800th pole of the northernmost electric power transmission line in Khabarovskiy Krai has been installed on the route from Nikolayevsk-Na-Amure to the village of Mnogovershinnyy. For the builders of the Dal'elektroset'stro Trust, this means that half the run is behind them. Behind them are difficult kilometers through Arctic tayga and along the cold Chlya Lake. In front are the White Mountains and beyond it is a vast swamp and yet another pass where the snow does not melt even in summer. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 15 Jun 79 p 2] 6521

OIL REFINING--Lithuanian SSR--A little time will pass and the first tank cars with petroleum products will be shipped from the small Lithuanian town of Mazheykyay. A large complex for refining oil which will come along the branch laid from the Uruzhsa oil pipeline, is being erected here. It is planned to start the first unit of the enterprise by the end of the year. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Jul 79 p 2] 6521

COAL PRODUCTION--The Ministry of the Coal Industry of the USSR reviewed the article "Surplus Coal," published on 19 May 1979, and feels that the criticism is correct. The ministry feels that Gosplan of the USSR and Gossnab of the USSR should establish a plan for production of Kansk-Achinsk coal on the basis of real need to create conditions which provide stable operation of the collectives of the coal mines and that the additional demand for the case of unforeseen increase of electric energy output at thermoelectric power

plants be made up by establishing an additional coal-production task. Establishment of an additional task on production of Kansk-Achinsk coal in the volume of 2.0 million tons is being provided by the ministry in the draft of the 1980 plan. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 6 Jul 79 p 2] 6521

CSO: 1822

INCREASING GAS PRODUCTION RESERVES IN THE KUBAN'

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 6, Jun 79 pp 2-3

[Article by V. Ya. Shevchuk and P. P. Makarenko, Kuban'morneftegazprom]

[Text] The collective of Kuban'morneftegazprom [Expansion unknown] fulfilled the plan of 3 years of the five-year plan ahead of schedule -- at the beginning of November of 1978. Successful fulfillment of the state tasks by the association became possible due to implementation of a complex of measures on improvement of the technology and technique of gas production, major overhaul of wells, accelerated introduction of newly discovered gas fields small in reserves into exploitation and maximum extraction of hydrocarbon raw material reserves from the interior.

The most acute problem during the last stage of exploiting the Kuban' gas fields is removal of the liquid from the bottom and shaft of gas condensate wells. A reduction of bed pressures to 20-30 kgf/cm² at the depths of deposition of productive horizons of 2,200-3,000 m and a decrease of well yields to 5,000-25,000 m³/day led to this reduction of the gas flow rates in the lift pipes, which do not provide removal not only of bed but also of condensation water.

For these reasons, approximately 350 gas wells or more than 50 percent of the operating fund have stopped flowing completely or partially without resorting to forced methods of liquid extraction.

The workers of the association in creative cooperation with SevKavNIIgaz [Northern Caucasus Scientific Research Institute of Natural Gas] has developed and extensively introduced a method of removing liquid from wells by using surfactant solutions.

Ionogenic surfactants -- sulphonol NP-3, "Novost'," "Don" and "Progress" powders and non-ionogenic surfactants -- OP-7, OP-10 and "Prevotsel" -- are used as the chemical reagent in the newly developed technique. The experience of practical use and field and laboratory investigations of various

surfactants have made it possible to determine their optimum concentrations for foaming of liquid mixtures of different fields.

It was established in this case that the prepared working solution should have a concentration of 2-5 percent as a function of the amount and composition of the liquid which must be foamed to provide removal of it from the well. The presence of up to 60 percent gas condensate in the liquid to be removed requires an increase of solution concentration to 8-10 percent and the use of mixtures of non-ionogenic and anion active surfactants.

The surfactant solutions are introduced into the pipe space of wells by inhibitor rigs, serially produced TsA-100 units, specially equipped pumping rigs based on Belarus' tractors, trailer-mounted pneumatic pumping plants and stationary "Lotos" automatic plants.

The economic effect from intensification of well operation by treating them with surfactant solutions reached 2.5 million rubles in 1978 and the additional gas production comprised 380 million m³.



Structural Map Along the Roof of Bench 1 of the Lower Cretaceous Productive Horizon of the Leningrad Field: 1 -- initial external GVK; 2 -- current GVK; 3 -- existing wells; 4 -- abandoned wells.

The effectiveness of the work carried out to remove the liquid from the wells is even higher since it is directed toward maximum extraction of gas and condensate reserves from the pools. New investigations begun in 1978 to

determine and introduce "entrapped" blocks of gas into exploitation in already depleted and flooded productive horizons of exhausted gas condensate fields are very promising in this direction.



Acetylene Black with the Highest Specific Surface Has Been Produced by a Process Developed by VNIIGaz. It is better than its analogs in the USSR and also abroad.

One of the successful illustrations of these investigations is the restoration and introduction of well 35 into operation, located in the free part of the central dome of the Leningrad field (see figure).

The well was put into operation after drilling in 1960 and all four benches of the productive horizon were operated simultaneously through a filter-screen lowered at the interval of 2,178-2,055 meters.

Insulation repair work was carried out in the well due to flooding and only bench I was open since 1966. At the end of 1977 the well was again flooded and was essentially taken out of operation at a bed pressure of 36 kgf/cm².

With regard to the fact that the well is in the highest part of the structure, it was decided to test the underlying benches II, III and IV. A second shaft was cut from a depth of 2,022 meters for these purposes, the well was deepened to 2,187 meters, geophysical investigations were conducted and a shank was lowered at the interval of 1,170-2,187 meters.

According to geophysical investigations, two beds in bench IV and one bed each in benches II and III were determined to be gas-saturated in the opened profile. A gas flow was obtained upon opening of the gas-saturated beds of bench IV at the interval of 2,161-2,165 meters and the well has been operational since 1 December 1978 (6 mm connecting pipe, pipe pressure of 84 kgf/cm², pressure beyond the pipe of 93 kgf/cm², gas yield of 35,000 m³/day and bed pressure of 108 kgf/cm²).

The operations made it possible to recover wells for the first time in the branch by cutting second shafts in the 5-inch operating column and proved the feasibility and effectiveness of the search and introduction of "entrapped" blocks of gas into operation in the flooded zones of depleted fields.

Three wells, which are now in operation, were restored by this method in 1978. An increase in the volume of operations both to study the geological material and to restore wells taken out of operation in the flooded zones of the Leningrad, Maykob, Berezanka and other fields where accumulation of residual gas reserves as possible, is planned this year.

The most important gas production reserves should include accelerated introduction of newly discovered gas and gas condensate fields, low in reserves, into operation. It should be noted in this case that the highly productive block-complete equipment developed on the basis of technical re-equipping of the gas industry for large gas fields is uneconomical under low-yield conditions.

To stabilize the gas production level, the association is annually developing 30-40 low-yield wells and is constructing 2-3 gas preparation installations using equipment released in old fields. This makes it possible to introduce new small fields with gas reserves from 300 million to 2-3 billion m^3 into operation at a forced pace. These fields are being developed through the efforts of the association without recruitment of contracting construction organizations of Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises].

Specialists of the association have worked out all the main blocks for gas-collection installations such as the gas separation block, the hydrate formation pump inhibitor block, the gas measuring block, the block of the sub-assembly for introducing the gas into the installation and so on.

The use of block equipment manufactured in the field repair shops made it possible to industrialize construction to a significant degree, to reduce the volume of construction-installation operations under field conditions and to provide accelerated introduction of the Azov, Severo-Ladoga, Novo-Serdyuk, Kruznil and other fields low in gas reserves during the past 3 years.

The implemented complex of measures makes it possible to introduce existing gas production reserves into operation, to provide above-plan fuel production and, which is the main thing, to stabilize the level of gas production throughout the association.

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CSO: 1822

METHODS OF INCREASING RATES OF GAS COLLECTIONS IN STAVROPOL' FIELDS

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 6, Jun 79 pp 4-6

[Article by V. I. Fuki, Stavropol'gazprom]

[Text] The experience of the Stavropol'gazprom Association [Stavropol' Gas Industry Association] shows the possibility of providing a high gas production coefficient during the final stage of field exploitation.

Reducing the rates of the decrease of gas yield in depleted fields and increasing the final gas production is a complex problem.

The operating experience of the Stavropol'gazprom Association indicated that the following are required to maintain high rates of gas production during the final stage of field exploitation and to produce a high gas yield:

constant monitoring of final depletion of both individual parts of the pool and of the pool as a whole;

systematic monitoring of field exploitation to prevent entrapment of the gas in individual sections of the pool and efficient use of bed energy;

increasing the operating efficiency of the production apparatus and installations for preparation of the gas for transport;

universal improvement of the operating conditions and the use of the capacity of the separator and head compressor stations according to the variable operating conditions of gas-producing fields;

constant improvement of the operating technology of wells under conditions of decreasing bed pressures, an increase of the moisture content of gas and an increase of the volumes of incoming bed water;

a fundamental change of the methods of major overhaul and underground repair of wells with bed pressure considerably lower than hydrostatic;

extensive use of methods of intensifying gas production which permit efficient use of bed energy.

Stavropol'skiy Kray is one of the first gas-producing regions of the country where the problem of maintaining the level of gas production was solved by maintaining high rates of collecting gas from fields entering the final stage of exploitation rather than by introduction of new fields.

Experimental-industrial introduction of many scientific developments which made it possible to provide stable exploitation of the wells and to maintain high levels of gas selection was carried out in the fields. The most effective were the developments of SevKavNIIgaz [Northern Caucasus Scientific Research Institute of Natural Gas] and of VNIIgaz [All-Union Scientific Research Institute of Natural Gas].

The North Stavropol' field was introduced into industrial exploitation in 1956. A total of 13 percent of the initial reserves had been sampled here by 1962 and the bed pressure decreased to 58.5 kgf/cm². In this regard further increase of gas production was provided by increasing the number of wells and also by construction and expansion of the head compressor stations.

A maximum reduction of pressure losses, which was achieved by reconstruction of the field development and reduction of the depth of the depression funnel by seasonal regulation of sampling from different parts of the field, was required for the greatest effectiveness of utilizing bed pressure.

The field entered a decreasing production period in 1969.

By 1 January 1979, 87.8 percent of the initial reserves had been sampled from the field, the annual sampling comprised 12.4 percent of current reserves during 1978 and the mean annual sampling during the entire period of exploitation comprised more than 4 percent of the initial reserves.

The high technical-economic indicators during the final stage of exploiting the field were achieved as a result of successful solution of the entire complex of arising problems.

The optimum arrangement of the main stock of wells in the central, more productive part of the field made it possible to maintain it for the entire period of operation and to produce gas with minimum energy expenditures. Seasonal regulation of field treatment permits a reduction of the depth of the depression funnel and prevents flooding of the neck between the North Stavropol' dome and the Pelagiadinsk section of the field.

A decrease of bed pressure caused a reduction of the daily yields of the wells from 300,000 m³ at the beginning of exploitation to 60,000 m³ in 1978, which led to complication of operation of the wells, since the gas flow rates in them became insufficient to extract the liquid. To ensure stable operation, 65 wells were equipped with automatic devices of the Lastochka

type, which made it possible to remove the liquid from the bottom. This permitted maintenance of the maximum yields due to automatic inclusion of the space beyond the pipe in operation.

Extensive use of surfactants permits a part of the wells to be operated up to the present time without utilizing pumping-compressor pipes (NKT), which are usually employed to provide the required gas lifting rates and removal of the liquid. "Don" and "Kristall" solid surfactants, liquid OP-10 and other surfactants are being utilized effectively at the North Stavropol' field.

The use of two- and three-phase foams during major overhaul and under grand repairs of wells significantly reduces the periods of both repair operations and depletion of the wells after repairs and moreover makes it possible to maintain the entire stock of wells in an efficient state. As a result, the operating factor throughout the field comprised 0.96 during 3 years of the 10th Five-Year Plan.

Automation of liquid discharge from the separators and water collectors installed in field gas pipelines was introduced for optimum utilization of bed energy. A total of 219 automatic liquid discharge machines is now operating constantly.

The level of gas production at the North Stavropol' field is determined by the state of the operating stock of wells and by the productivity of the head compressor stations, which operate with constantly decreasing pressure during reception (3.2-3.4 kgf/cm² at the input to the head installations).

During the past 10 years, the Izobil'nyy Compressor Station passed through 6 stages of reconstruction which reduced to increasing the compression stages and introduction of more productive rotors of the centrifugal impellers.

An additional 3.3 billion m³ of gas was delivered from the field since the beginning of the Ninth Five-Year Plan as a result of reconstruction of the Izobil'nyy Compressor Station. The experience of operating multistage head compressor stations using centrifugal impellers has been accumulated at this compressor station. This experience is also now being utilized at other fields entering the final stage of exploitation such as Gazli and Shebelinskoye.

A somewhat different approach was required during the final stage of exploitation of the Mirnyy gas condensate field, which has been exploited since 1968 and which entered the stage of decreasing production in 1974 upon sampling of 44 percent of the initial reserves from it. The field is characterized by high corrosion danger, content of up to 100 g/m³ of condensate in the gas and high bed temperatures.

Investigations conducted during the past few years were directed toward maintaining high rates of exploitation and more complete utilization of the condensate produced with the gas. Liquid surfactants began to be used along

with the traditional method of selecting pop-compressor pipes of the required diameter to insure optimum removal of the liquid from the bottom of the wells. A great deal of attention is being devoted to increasing the productivity of wells by uniting additional objects (gas-bearing beds) by perforation in the gas medium under pressure and by treatment of the bottom zone with hydrophobic emulsifying substances.

A complex technique using two- and three-phase foams was developed to carry out repair operations in wells with pressures considerably below hydrostatic and with high temperatures. Preparation of the gas for transport presents significant production difficulties at the field. This is explained by the lack of bed energy to accomplish the designed NTS process. Introduction of air cooling apparatus and the use of the Mirnoye-Izobil'noye gas pipeline for collection and utilization of the condensate made it possible to solve the problem. Construction of an experimental-industrial plant for cleaning this gas pipeline with complete utilization of all the liquid produced in it and reconstruction of the third gas-drying unit at Izobil'nyy made it possible to deliver standard gas to customers and to achieve a high yield of commercial condensate.

Problems of removing the liquid from the bottoms of the wells and intensification of gas production must be solved from the first days of operation at low-yield fields. Measures to increase the rates of exploitation began to be considered even during the planning stage.

Hydraulic fracturing of the bed, strengthening of the bottom zone in brittle collectors and treatment of the bottom zone with methanol, surfactants and condensate were used extensively here. All this made it possible to increase the working yields of the wells by a factor of 1.3-1.7. Moreover, the effect due to hydraulic fracturing of the bed is maintained for 5-6 years.

Extensive use of solid and liquid surfactants, mechanical methods using a plunger lift and other measures which provide removal of the liquid from the bottoms of the wells made it possible to achieve stable operation of low-yield wells.

The experience of operating the fields of Stavropol'skiy Kray showed the high effectiveness of the implemented measures during the last stage of field exploitation.

The noted measures made it possible to reduce by 10 percent the rate of decreasing production in the fields entering the final stage of exploitation.

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PROSPECTS OF THE GAS AND GAS CONDENSATE FIELDS OF UKRGAZPROM ASSOCIATION

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 6, Jun 79 pp 6-8

[Article by A. V. Boboshko and I. N. Tokoy, Ukrgazprom]

[Text] To increase the gas supply reliability in the Ukrainian SSR, the gas and gas condensate fields of the VPO [All-Union Production Association] Ukrgazprom can be regarded not only as sources of gas, but also as gas supply regulators.

The Ukrainian SSR is one of the oldest gas-producing regions. Thus, gas production was begun as early as 1924 in the Pre-Carpathian area.

The important national economic significance of the gas and gas condensate fields of the Ukrainian SSR, usually located near large gas consumers, determined their accelerated introduction into exploitation and these fields have become some of the main gas suppliers to the industrial centers of the European SSR and for export during the past 20 years. The large volumes of geological prospecting work conducted in the republic and the compressed deadlines for development of new fields during the entire considered period contributed to this.

The Ukrgazprom Association is now exploiting 55 gas and gas condensate fields, of which 32 are located in the Eastern Ukrainian oil- and gas-bearing basin (the Dnepr-Donetsk depression and the northern boundaries of the Donbass) and 23 are located within the Pre-Carpathian Pre-Montane trough.

The initial gas reserves of industrial categories from the fields exploited by the VPO Ukrgazprom comprised 1 trillion 487 billion m³ including 1 trillion 247 billion m³ in the Dnepr-Donetsk basin and 240 billion m³ in the Pre-Carpathian trough.

Despite the large number of fields in exploitation, the main volume of production was achieved in a comparatively small group of fields (Shebelinskoye, Krestishchenskoye, Yefremovskoye, Melikhovskoye, Oposhnyanskoye, Mashevskoye, Bil'che-Volitskoye, Ugerskoye, Rudkovskoye and Bitkovskoye). These fields are

now being exploited under conditions of decreasing gas production, which determine the general decrease of gas production throughout Ukrgazprom.

An increase of production for the next few years is planned in fields which were introduced in 1978 and which will be introduced in 1979-1980.

The geological-industrial characteristics of the new fields permits one to relate them to fields low in reserves and inadequately proven for concentration of operational drilling and field development here. An exception is only the Timofeyevskoye field at which it is planned to set up an experiment to pump water in the Turneyskaya pool to force the gas from the lower horizons. According to calculations, this will make it possible to provide additional condensate production.

It is planned to increase gas production by 1.4 billion m^3 throughout the group of new fields in 1980, which will only partially make up for the decrease of production in the old fields.

Let us dwell in more detail on the status and prospects of exploitation of some main gas condensate fields.

The largest in the Ukraine is the Shebelinskoye field (exploited since 1956), whose initial gas reserves by pressure drop are now estimated at 565 billion m^3 . A total of 467 billion m^3 of gas (88 percent of initial reserves) has been produced from the field since the beginning of exploitation. The field has already been exploited for a number of years with decreasing gas production. The maximum annual yield during the period of constant production (1967-1972) comprised 31.3 billion m^3 ; 14.2 billion m^3 of gas was produced in 1978. The field is exploited by 580 wells and the average working yield of 1 well comprises 67,500 m^3 /day. The current bed pressure is 52 kgf/cm^2 and the mean working pressure at the input to the UKPG is 24 kgf/cm^2 . The gas is compressed by 2 compressor stations.

The complications in operation of the Shebelinskoye field should primarily include the intensive salt formation in the pumping-compressor pipes (NKT) up to complete clogging of them. The most probable cause of salt formation is the precipitation of condensate waters in the bottom zone of the well and shifting of them by highly mineralized residual waters. Because of this, the phase permeability of the bottom zone increases for water, the water acquires mobility and part of it is carried into the well shaft, where the process of salt precipitation also occurs due to the changed thermodynamic conditions.

There is a direct relationship between the value of depression and the intensity of salt formation: more intensive salt formation occurs in wells operating with high depression.

The main method of controlling salt formation at present is periodic flushing of the well. Investigations showed that small volumes of fresh water in the space beyond the pipe are most effective.

Corrosion of the pump-compressor pipes, which leads to breakdown of them or formation of openings in the NKT, considerably complicates well operation. The most effective method of detecting holes is yield measurement. A large volume of thermal and yield measurement work is constantly carried out at the Shebelinskoye field which permits timely detection of NKT malfunctions.

Flooding of the Shebelinskoye field is limited in nature and is primarily selective. The migration of bed waters was noted along the most permeable beds, in the central part of the field, by the intensively developed tectonic disturbances here.

Drilling evaluation-operating wells within the peripheral part of the pool made it possible in some cases to determine poorly drainable sections, which led to some increase of gas reserves.

Maintenance of the large stock of operating wells in a working state, intensifying operations to diagnose malfunctions of flow pipes and introduction of more effective methods of controlling salt formation acquire primary significance to provide a high coefficient of final gas yield.

The Krestishchenskoye field is the second gas condensate field of the Ukraine in size (it has been exploited since 1970). The initial gas reserves are 318.7 billion m^3 . The drainable gas reserves are now estimated at 300 billion m^3 . The commercial gas content is related to sandstone-aleurolitic collectors of the Upper Carboniferous (first and second operating objects) and to deposits of the Kartamyshskaya formation of the Lower Permian (third operating object).

Modelling the exploitation for the future, carried out in 1977 jointly with VNIIGaz, showed that a flexible water-delivery mode will gradually be manifested during the later periods of exploitation. Selective migration of bed waters through individual highly permeable interlayers of gravelites (second operating object) is possible in this case.

Among the measures which provide an increase of the technical-economic indicators of exploiting the field by the VPR Ukrgazprom, the accelerated introduction of the first productive test wells with laying of loops to the nearest exploited fields, the use of surfactants to remove liquid from the bottoms of the wells, hydrochloric acid and alcohol acid treatment of the bottom zones of wells, hydraulic fracturing of the bed, perforation of new objects in operating wells and field-geophysical investigations are used extensively. The use of the cycling process is provided at new gas condensate fields with high condensate content.

The volumes of transported gas for local gas supply and for export have now been increased significantly. Gas will be delivered from the regions of Western Siberia, Central Asia and Orenburg to meet the needs of the Ukrainian SSR for gas and to increase deliveries for export.

The considerable remoteness of gas production sources requires an increase of the dependability of gas supply. Therefore, the gas and gas condensate fields of Ukgazprom may subsequently be regarded not only as sources of gas, but also as gas supply regulators.

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FUELS AND RELATED EQUIPMENT

CONTROLLING THE EFFICIENCY OF GAS UTILIZATION

Moscow GAZOVAYA PROMYSHLENNOST' in Russian No 6, Jun 79 p 39

[Article by N. A. Kuliyeu, chief of the Azerbaijan Territorial Inspectorate of Gosgaznadzor of the USSR]

[Text] At the beginning of 1979, the Azerbaijan Territorial Inspectorate of Gosgaznadzor of the USSR and the Baku Committee of People's Control held a seminar-conference devoted to the timely problem of increasing the efficiency of gas utilization in Baku. Leading specialists of Baku industrial enterprises participated in it.

The reports and speeches of responsible workers of the Azerbaijan Territorial Inspectorate of Gosgaznadzor of the USSR, Gosplan of the republic, the Baku Committee of People's Control and the committee on efficient use of resources were devoted to the need for efficient use of gas fuel.

Representatives of a number of plants who gave speeches at the seminar talked about the role of the territorial inspectorate of Gosgaznadzor of the USSR in ensuring the effectiveness of gas utilization by enterprises and adhering to gas consumption discipline. A great deal of attention was devoted in the speeches to the need to replace uneconomical gas-compressing units and it was noted that more economical units are already being introduced by many enterprises. This replacement and also fulfillment of the schedules of the territorial inspectorate will permit enterprises to achieve a significant gas saving.

The conference adopted the following decisions:

--to entrust the ministries and agencies of the republic with monitoring timely and high-quality regime-adjustment operations at subordinate enterprises;

--obligate the VPO [All-Union Production Association] Soyuzneftemash to conclude an agreement with a qualified adjusting organization to conduct regulation work at all its plants;

--obligate Glavgaz [Main Administration of the Gas Industry] of Azerbaijan to apply punitive sanctions to customers who consume gas fuel above established limits;

--forbid enterprises and Azgaznaladka of Glavgaz of Azerbaijan to utilize individually manufactured gas burning devices.

The seminar-conference was an important measure for the efficiency of natural gas utilization and observation of state discipline in gas consumption.

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MINERALS

URGENT PROBLEMS IN ESTABLISHING THE UDOKAN ORE ENRICHMENT COMBINE

Moscow SOVETSKAYA ROSSIYA in Russian 27 Jun 79 p 2

[Article by A. Nedeshev, doctor of geographic sciences, member of the Scientific Council of the USSR Academy of Sciences on Problems of BAM: "Agency Dissonance"]

[Text] Udokan was discovered not so long ago -- 30 years ago. And 15 years later this copper deposit had already achieved realistic outlines and a state committee had confirmed its reserves. A decision was then made to create the Udokan Ore Enrichment Combine.

Industrial and living quarters must be constructed and a large modern town must now be erected in the remote tayga of the Transbaykal, where you can still meet geologists, hunters and reindeer. Laying of the first footings will begin with the approach of the Baykal Amur Mainline Railroad, the rail track of which is vigorously approaching from the direction of Tynda.

Are we ready for the beginning of construction? It should be said that science and practice have not come to this region with empty hands. The scientists and specialists have the richest experience accumulated at other points of the BAM zone. Moreover, the attention of a number of academic and sector scientific research institutes, planning and design organizations has been directed toward the problems of Udokan.

Timely developments and investigations are being coordinated within the framework of the complex program "Siberia" -- problems of effective assimilation of the Udokan copper deposit are being solved among its regional sections. Specifically, the geological structure of the future regions must be studied in detail and investigations on seismology must be continued. Of course, the complex of measures on environmental protection is at the center of attention.

It is planned to erect the town of Udokan in the Charskaya basin in the northern Transbaykal and the searchers have already selected sites suitable for industrial and housing construction. But this basin is well-protected

from all winds. And calm weather predominates in it for long months. Hence, there are stagnant air zones and an almost complete absence of natural ventilation. Thus, we should think beforehand about protecting the urban atmosphere and of preventing pollution of it by industrial gasses. This means that all housing and production buildings of Udokan for our own needs, including those for heating, should utilize electric energy. A similar practice gave a good account of itself at Ust'-Ilinsk, Zeya and other new eastern towns.

The powerful GES, designed in the vicinity of Vitima, can completely provide Udokan with the required energy. The research has mainly been carried out and construction work has also been organized here with the approach of the BAM. They should be carefully coordinated with the deadlines for establishing the town itself. Construction of powerful LEP [Overhead electric power transmission lines], required not only by Udokan but by other complexes as well, should also be begun as quickly as possible.

The problem of new technology and the problem of the effectiveness of the planned production are also closely related to development of remote regions. The scientists of the Siberian Department of the USSR Academy of Sciences have taken an excellent initiative. Their slogan is: "The Technology of the 21st Century for the BAM Zone!" But what should our future production be? Some of its fragments can be judged even today. For example, Academician N. V. Mel'nikov has advanced the idea of modernizing the mining industry -- of developing it without recruiting additional workers, technicians and engineers. Specifically, the group of metal mining should be provided by introduction of future production procedures which simulate natural processes.

The technique of refining the ores of nonferrous metals based on so-called dry separation, developed by a collective of the Institute of Mining of the Siberian Department of the USSR Academy of Sciences, is of great interest. The innovation is very efficient, and, moreover, may be successfully combined with the previous, traditional production operations for our enriching plants.

However, this valuable proposal requires experimental-industrial checking. And this is not so much a troublesome matter as it is one which does not correspond to the profile of an academic institute. The branch scientific research institutes and design offices regard the development of the Siberian scientists as "foreign." The planners will complete the contract design for development of the Udokan Ore Enrichment Combine within 2-3 years and it will then be much more complicated to put new ideas into production.

Moreover, from the viewpoint of economics, the problem of ore concentration is one of the most important for Udokan. And one must struggle for each additional percent of metal extracted from the Udokan ore.

The leading branch institutes (Gintsvetmet [State Scientific Research Institute of Nonferrous Metals], Mekhanobr [All-Union Scientific Research and Planning Institute for the Mechanical Processing of Minerals] and others) have long been conducting investigations in this direction. Many grades of

Udokan ore have already been investigated. The Ministry of Nonferrous Metallurgy of the USSR has planned to construct an experimental-industrial enterprise at Udokan for extensive study of them. But they thought it over: they were afraid of the cost-increase factors at Mintsvet [Ministry of Nonferrous Metals]. Actually, it is cheaper and easier to cull hundreds and even thousands of tons of local ore from Udokan for investigation than it is to organize even a small, but sufficiently complex shop on an empty site. This course of arguments reflects the agency approach and the attempt to limit oneself only to today's concerns. But if one looks into the future, an experimental enterprise will make it possible to put together beforehand a strong, combat-capable collective of miners which will then become the backbone of an enormous mine. And the main thing is its design will be created with regard to all factors in this case, economic, technical and social.

It is in the eastern regions, in the zone of the Baykal-Amur Mainline Railroad that the latest advances of scientific and technical progress must be introduced immediately. And, in planning new construction projects, we should now think about how to reduce the number of workers at future enterprises, to achieve maximum mechanization of all processes and to eliminate manual labor.

The outlines of the technology for future years are already being considered today. For example, let us take the Southern Yakutsk Coal Combine. Mining machines with productivity previously unheard of were the first to be used there. The 180-ton dump trucks and the 20-cubic meter excavators look magnificent.

However, the overall impression from the Southern Yakutsk Complex is not so optimistic. The nearby town of Neryungri is densely populated with different auxiliary and service plants with large staffs of the most diverse personnel. Will these staffs not "eat up" the advantages provided by supertechnology? They will to a known degree! Many people still engaged in small, poorly mechanized shops, workshops and organizations are required here per worker in main production. And this is with an acute shortage of housing and sociocultural-service institutions!

Unfortunately, a similar pattern is also typical for other large construction projects of Siberia. Academician A. G. Aganbegyan, recently giving a speech at Tynda at the conference "Man on the BAM," presented the following data. Only three percent of the workers are engaged in oil production in the Central Ob' regions, while the remaining 97 percent are working in service sectors.

Have organization of work and technology really become stagnant at the level of the 19th century in supply, repair, trade and communal economy? Where are the scientific research and planning-research institutions which are engaged in this problem? Why have they not appeared on the BAM? Tens of institutes are concerned with problems of increasing labor productivity,

mechanization and automation of basic production. The problem of the service sphere is most frequently being solved spontaneously.

An industrial, construction or transport ministry, each separately, is responsible only for its own plants and for introduction of innovations at its own enterprises. Complex social problems "slip out" from the visual field of the branch managers. In struggling to reduce the cost of production, the ministries are economizing primarily on housing and social-cultural service objects. On the other hand, the local Soviets are intensely interested in whether as many large modern apartments, clubs, department stores, dining halls, hospitals, baths and barbershops as possible are included in the plans and estimates. But in many cases they are deprived of the opportunity to affect the course of construction.

Only five percent of the housing fund is in the hands of the local Soviets at the same Tynda. It is no accident that the following voices are frequently heard among the scientists and practitioners: "There is no management in the villages and towns on the BAM." The local Soviets of Working Peoples Deputies should undoubtedly occupy a more active position and should strictly monitor the distribution of resources with regard to future development of new towns and villages, which are allocated by the ministries and agencies for construction of housing and social-cultural-service enterprises. SOVETSKAYA ROSSIYA noted the urgency of these problems and published materials of the guest editorial "The Siberian Block Train." Much has already been done, but there still remains a number of problems, solution of which is being postponed due to the difference of the agency views toward a general state problem.

Science should also make an important contribution here.

The complex program "Siberia" should now become the reference point not only for the scientists but also for many party, Soviet and economic organs, everyone who is related to the future eastern regions of the country.

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